WHAT IS CLAIMED IS:

1. A laser irradiation apparatus comprising:

a laser oscillator;

a first optical system for processing a laser beam outputted from the laser oscillator in order to shape a beam spot into a linear shape or an elliptical shape on a surface to be irradiated;

a second optical system for controlling a branching ratio of polarization of the processed laser beam;

a third optical system having a transmittance that is dependent on a polarization direction of the laser beam;

a deflection means for deflecting the processed laser beam toward the surface to be irradiated; and

a fourth optical system for making the beam spot a image formation at arbitrary coordinates on the surface to be irradiated.

2. A laser irradiation apparatus according to claim 1, wherein the means for controlling the branching ratio of polarization of the laser beam is a half-wave plate.

3. A laser irradiation apparatus according to claim 1, wherein the deflection means is a polygon mirror or a galvanometer mirror.

4. A laser irradiation apparatus according to claim 1, wherein the optical system for making the beam spot the image formation is an f-θ lens.

5. A laser irradiation apparatus according to claims 1, wherein the laser

oscillator is a continuous wave solid state laser.

6. A laser irradiation apparatus according to claim 1, wherein the laser oscillator is a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

7. A laser irradiation apparatus according to claim 5, wherein the laser oscillator is a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

8. A laser irradiation apparatus according to claim 1, wherein the laser oscillator is a continuous wave Ar laser or a continuous wave Kr laser.

9: A laser irradiation apparatus according to claim 6, wherein the laser oscillator outputs a harmonic wave.

10. A laser irradiation apparatus according to claim 9, wherein the laser oscillator outputs a harmonic wave.

11. A laser irradiation apparatus comprising:

a laser oscillator;

a first optical system for processing a laser beam outputted from the laser oscillator in order to shape a beam spot into a linear shape or an elliptical shape on a surface to be irradiated;

a second optical system for controlling a branching ratio of polarization of the processed laser beam;

a third optical system having a reflectance that is dependent on a polarization direction of the laser beam;

a deflection means for deflecting the processed laser beam toward the surface to be irradiated; and

a fourth optical system for making the beam spot a image formation at arbitrary coordinates on the surface to be irradiated.

12. A laser irradiation apparatus according to claim 11, wherein the means for controlling the branching ratio of polarization of the laser beam is a half-wave plate.

13. A laser irradiation apparatus according to claim 11, wherein the deflection means is a polygon mirror or a galvanometer mirror.

14. A laser irradiation apparatus according to claim 11, wherein the optical system for making the beam spot the image formation is an f-θ lens.

15. A laser irradiation apparatus according to claim 11, wherein the laser oscillator is a continuous wave solid state laser.

16. A laser irradiation apparatus according to claim 11, wherein the laser oscillator is a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti :

sapphire laser.

17. A laser irradiation apparatus according to claim 15, wherein the laser oscillator is a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

18. A laser irradiation apparatus according to claim 11, wherein the laser oscillator is a continuous wave Ar laser or a continuous wave Kr laser.

19. A laser irradiation apparatus according to claim 11, wherein the laser oscillator outputs a harmonic wave.

20. A laser irradiation apparatus according to claim 16, wherein the laser oscillator outputs a harmonic wave.

21. A laser irradiation apparatus according to claim 18, wherein the laser oscillator outputs a harmonic wave.

22. A method of manufacturing a semiconductor device, comprising the steps of:

forming an amorphous semiconductor film over a substrate;

processing a laser beam outputted from the laser oscillator in order to shape a beam spot into a linear shape or an elliptical shape on the amorphous semiconductor film, controlling a branching ratio of polarization of the processed laser beam, transmitting the laser beam through an optical system that has a transmittance dependent on a polarization direction of the laser beam, deflecting the transmitted laser beam toward the surface to be irradiated, shaping the beam spot at arbitrary coordinates on the surface to be irradiated and performing laser annealing on the amorphous semiconductor film,

wherein the branching ratio of polarization is changed such that an irradiation energy received by the surface to be irradiated is uniformized.

23. A method of manufacturing a semiconductor device according to claim 22, wherein the laser beam is outputted from a continuous wave solid state laser.

24. A method of manufacturing a semiconductor device according to claim 22, wherein the laser oscillator is a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

25. A method of manufacturing a semiconductor device according to claim 23, wherein the laser beam is outputted from a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

26. A method of manufacturing a semiconductor device according to claim 22, wherein the laser beam is outputted from a continuous wave Ar laser or a continuous wave Kr laser.

27. A method of manufacturing a semiconductor device according to claim 22, wherein the laser oscillator outputs a harmonic wave.

28. A method of manufacturing a semiconductor device according to claim 25, wherein the laser oscillator outputs a harmonic wave.

29. A method of manufacturing a semiconductor device according to claim 26, wherein the laser oscillator outputs a harmonic wave.

30. A method of manufacturing a semiconductor device, comprising the steps of:

forming an amorphous semiconductor film over a substrate;

processing a laser beam outputted from the laser oscillator in order to shape a beam spot into a linear shape or an elliptical shape on the amorphous semiconductor film, controlling a branching ratio of polarization of the processed laser beam, reflecting the laser beam through an optical system that has a reflectance dependent on a polarization direction of the laser beam, deflecting the reflected laser beam toward the surface to be irradiated, shaping the beam spot at arbitrary coordinates on the surface to be irradiated and performing laser annealing on the amorphous semiconductor film,

wherein the branching ratio of polarization is changed such that an irradiation energy received by the surface to be irradiated is uniformized.

31. A method of manufacturing a semiconductor device according to claim 30, wherein the laser beam is outputted from a continuous wave solid state laser.

32. A method of manufacturing a semiconductor device according to claim 30, wherein the laser beam is outputted from a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

33. A method of manufacturing a semiconductor device according to claim 31, wherein the laser beam is outputted from a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

34. A method of manufacturing a semiconductor device according to claim 30, wherein the laser beam is outputted from a continuous wave Ar laser or a continuous wave Kr laser.

35. A method of manufacturing a semiconductor device according to claim 30, wherein the laser oscillator outputs a harmonic wave.

36. A method of manufacturing a semiconductor device according to claim 31, wherein the laser oscillator outputs a harmonic wave.

37. A method of manufacturing a semiconductor device according to claim 34, wherein the laser oscillator outputs a harmonic wave.

38. A laser irradiation apparatus comprising:

a laser oscillator;

a first optical system for processing a laser beam outputted from the laser oscillator in order to shape a beam spot into a linear shape or an elliptical shape on a surface to be irradiated;

a second optical system for controlling a branching ratio of polarization of the processed laser beam;

a third optical system having a transmittance and reflectance that are dependent on a polarization direction of the laser beam;

a deflector for deflecting the processed laser beam toward the surface to be irradiated; and

a fourth optical system for making the beam spot a image formation at arbitrary coordinates on the surface to be irradiated.

39. A laser irradiation apparatus according to claim 38, wherein the means for controlling the branching ratio of polarization of the laser beam is a half-wave plate.

40. A laser irradiation apparatus according to claim 38, wherein the deflector is a polygon mirror or a galvanometer mirror.

41. A laser irradiation apparatus according to claim 38, wherein the optical system for making the beam spot the image formation is an f-θ lens.

42. A laser irradiation apparatus according to claims 38, wherein the laser oscillator is a continuous wave solid state laser.

43. A laser irradiation apparatus according to claim 38, wherein the laser oscillator is a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

44. A laser irradiation apparatus according to claim 42, wherein the laser oscillator is a continuous wave laser selected from the group consisting of a YAG laser, a YVO_4 laser, a YLF laser, a $YAlO_3$ laser, a Y_2O_3 laser, an alexandrite laser, and a Ti : sapphire laser.

45. A laser irradiation apparatus according to claim 38, wherein the laser oscillator is a continuous wave Ar laser or a continuous wave Kr laser.

46. A laser irradiation apparatus according to claim 42, wherein the laser oscillator outputs a harmonic wave.

47. A laser irradiation apparatus according to claim 45, wherein the laser oscillator outputs a harmonic wave.